


# **EUCHNER**

## **Operating Instructions**

**Transponder-Coded Safety Switch With Guard Locking For Process Protection**  
**CTP-I.-AS Unicode/Multicode**

**EN**

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## 1. About this document





### 1.1. Scope

These operating instructions are valid for all CTP-I.-AS... from version V1.0.0. These operating instructions, the document *Safety information* and any enclosed data sheet form the complete user information for your device.

### 1.2. Target group





Design engineers and installation planners for safety devices on machines, as well as setup and servicing staff possessing special expertise in handling safety components.

### 1.3. Key to symbols

Symbol/depiction	Meaning
	Printed document
	Document is available for download at <a href="http://www.euchner.com">www.euchner.com</a>
 <b>DANGER</b> <b>WARNING</b> <b>CAUTION</b>	Safety precautions <b>Danger</b> of death or severe injuries <b>Warning</b> about possible injuries <b>Caution</b> slight injuries possible
 <b>NOTICE</b> <b>Important!</b>	<b>Notice</b> about possible device damage <b>Important</b> information
<b>Tip</b>	Useful information

### 1.4. Supplementary documents

The overall documentation for this device consists of the following documents:

Document title (document number)	Contents	
Safety information (2525460)	Basic safety information	
Operating instructions (2543028)	(this document)	
Possibly enclosed data sheet	Item-specific information about deviations or additions	
	<b>Important!</b>  Always read all documents to gain a complete overview of safe installation, setup and use of the device. The documents can be downloaded from <a href="http://www.euchner.com">www.euchner.com</a> . For this purpose enter the doc. no. in the search box.	

2. Correct use

Safety switches series CTP-I.-... are operated as slaves on the safety bus AS-Interface Safety at Work and function as interlocking devices with guard locking solenoid for process protection (type 4) without guard locking monitoring. The device complies with the requirements according to EN IEC 60947-5-3. Devices with unicode evaluation possess a high coding level, devices with multicode evaluation possess a low coding level.

In combination with a movable guard and the machine control, this safety component prevents dangerous machine functions from occurring while the guard is open. A stop command is triggered if the guard is opened during the dangerous machine function.

This means:

- › Starting commands that cause a dangerous machine function must become active only when the guard is closed.
- › Opening the guard triggers a stop command.
- › Closing a guard must not cause automatic starting of a dangerous machine function. A separate start command must be issued. For exceptions, refer to EN ISO 12100 or relevant C-standards.

Before the device is used, a risk assessment must be performed on the machine, e.g. in accordance with the following standards:

- › EN ISO 13849-1
- › EN ISO 12100
- › IEC 62061

Correct use includes observing the relevant requirements for installation and operation, particularly based on the following standards:

- › EN ISO 13849-1
- › EN ISO 14119
- › EN 60204-1

The safety switch is allowed to be operated only in conjunction with the intended EUCHNER actuator and the related connection components from EUCHNER. On the use of different actuators or other connection components, EUCHNER provides no warranty for safe function.




	<b>Important!</b> <ul style="list-style-type: none"><li>› The user is responsible for the proper integration of the device into a safe overall system. For this purpose, the overall system must be validated, e.g. in accordance with EN ISO 13849-2.</li><li>› It is only allowed to use components that are permissible in accordance with the table below.</li></ul>
-------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Table 1: Possible combinations for CTP components

Safety switch	Actuator	
	A-C-H-...	
CTP-I.-... Unicode/Multicode		
Key to symbols		Combination possible, guard locking for process protection

### 3. Description of the safety function

Devices from this series feature the following safety functions:

#### Monitoring of the guard position (interlocking device according to EN ISO 14119)

- › Safety function (see chapter 6.3. *Switching states on page 8*):
  - When the guard is open, no valid code sequence is sent (monitoring of the door position).
- › Safety characteristics: category, Performance Level, PFH<sub>D</sub> (see chapter 13. *Technical data on page 19*).

### 4. Exclusion of liability and warranty

In case of failure to comply with the conditions for correct use stated above, or if the safety regulations are not followed, or if any servicing is not performed as required, liability will be excluded and the warranty void.

### 5. General safety precautions

Safety switches fulfill personnel protection functions. Incorrect installation or tampering can lead to fatal injuries to personnel.

Check the safe function of the safeguard particularly

- › after any setup work
- › after the replacement of a system component
- › after an extended period without use
- › after every fault

Independent of these checks, the safe function of the safeguard should be checked at suitable intervals as part of the maintenance schedule.



#### **WARNING**

Danger to life due to improper installation or due to bypassing (tampering). Safety components fulfill a personnel protection function.

- › Safety components must not be bypassed, turned away, removed or otherwise rendered ineffective. On this topic pay attention in particular to the measures for reducing the possibility of bypassing according to EN ISO 14119:2013, section 7.
- › The switching operation must be triggered only by actuators designated for this purpose.
- › Prevent bypassing by means of replacement actuators (only for multicode evaluation). For this purpose, restrict access to actuators and to keys for releases, for example.
- › Mounting, electrical connection and setup only by authorized personnel possessing the following knowledge:
  - specialist knowledge in handling safety components
  - knowledge about the applicable EMC regulations
  - knowledge about the applicable regulations on operational safety and accident prevention



#### **Important!**

Prior to use, read the operating instructions and keep these in a safe place. Ensure the operating instructions are always available during mounting, setup and servicing. For this reason you should archive a printed copy of the operating instructions. You can download the operating instructions from [www.euchner.com](http://www.euchner.com).

### 6. Function

The device monitors the position of movable guards.

The system consists of the following components: coded actuator (transponder) and switch.

Whether the device learns the complete actuator code (unicode) or not (multicode) depends on the respective version.

- **Devices with unicode evaluation:** The actuator must be assigned to the safety switch by a teach-in operation so that it is detected by the system. This unambiguous assignment ensures a particularly high level of protection against tampering. The system thus possesses a high coding level.
- **Devices with multicode evaluation:** Unlike systems with unicode evaluation, on multicode devices a specific code is not requested but instead it is only checked whether the actuator is of a type that can be detected by the system (multicode detection). There is no exact comparison of the actuator code with the taught-in code in the safety switch (unicode evaluation). The system possesses a low coding level.

When the guard is closed, the actuator is moved into the safety switch. When the operating distances are reached, power is supplied to the actuator by the switch and data transfer begins.

If the guard is closed and the code is permissible, each CTP-AS transmits a switch-specific, unique safety code sequence with 8 x 4 bits via the AS-Interface bus.

The zero sequence is transmitted via the AS-Interface bus when the guard is opened.

In the event of a fault in the safety switch, the zero sequence is transmitted via the AS-Interface bus and the LOCK/DIA LED illuminates red. The occurrence of faults is detected at the latest on the next demand to close the safety outputs (e.g. on starting).

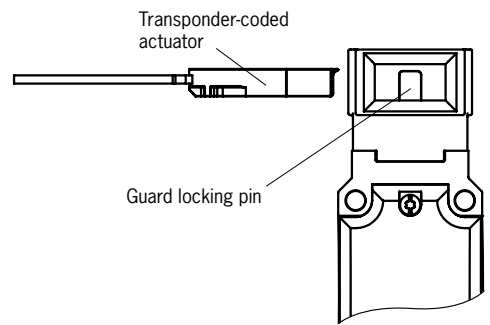
#### 6.1. Guard locking on version CTP-I1

(guard locking actuated by spring force and released by power-ON)

**Activating guard locking:** Close guard; no auxiliary power at the solenoid and/or clear AS-Interface output bit D0.

**Releasing guard locking:** Apply auxiliary power to the solenoid and set AS-Interface output bit D0.

The spring-operated guard locking functions in accordance with the closed-circuit current principle. If auxiliary power is interrupted, guard locking remains active and the guard cannot be opened directly.



#### Important!

- If the guard is open when the auxiliary power is interrupted and the guard is then closed, guard locking is activated. This can lead to persons being locked in unintentionally.

The actuator cannot be pulled out of the switch and the guard is locked as long as the guard locking pin is extended.

If the solenoid is controlled via the AS-Interface bus and auxiliary power is applied to the solenoid, the guard locking pin is retracted and the actuator is released. The guard can be opened.

## 6.2. Guard locking on version CTP-I2

(guard locking actuated by power-ON and released by spring force)

**Activating guard locking:** Apply auxiliary power to the solenoid and set AS-Interface output bit D0.

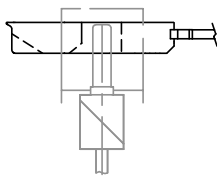
**Releasing guard locking:** No auxiliary power at the solenoid and/or clear AS-Interface output bit D0.

The magnetically actuated guard locking operates in accordance with the open-circuit current principle. If the solenoid is not controlled (D0=0) or if auxiliary power is switched off, guard locking is released and the guard can be opened directly!

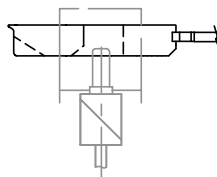
If the solenoid is controlled via the AS-Interface bus (D0=1) and auxiliary power is applied to the solenoid, the guard locking pin is held in extended position and the guard is locked.

## 6.3. Switching states

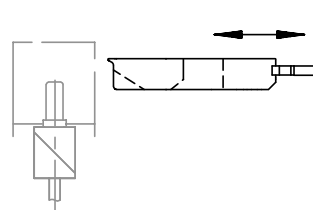
Guard closed and locked



Guard closed and not locked



Guard open



Programming	State	D0, D1	D2, D3	Monitor diagnostics
Dual-channel dependent Synchronization time ≥ 100 ms / Dual channel positively driven	Guard closed	Code sequence		Green If start-up test selected: yellow flashing on start-up
	Intermediate state during opening or closing of the guard. Switch S1 (internal) open	Half-sequence	00	On opening: yellow flashing On closing: red After expiration of the synchronization time: yellow flashing
	Intermediate state during opening or closing of the guard. Switch S2 (internal) open	00	Half-sequence	
	Guard open	00	00	Red
	Address 0 or communication disrupted	–		Gray



### 7. Manual release

Some situations require the guard locking to be released manually (e.g. malfunctions or an emergency). A function test must be performed after release.

More information on this topic can be found in the standard EN ISO 14119:2013, section 5.7.5.1. The device can feature the following release functions:

#### 7.1. Auxiliary release and auxiliary key release

In the event of malfunctions, the guard locking can be released with the auxiliary release or the auxiliary key release irrespective of the state of the solenoid.


Open the guard and close it again after resetting the auxiliary release or auxiliary key release. The device will then operate normally again.

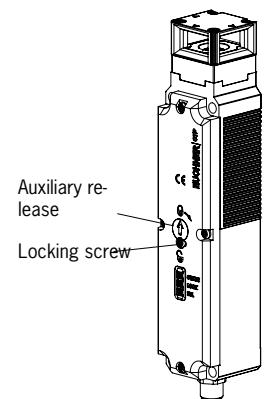


#### Important!

- › The actuator must not be under tensile stress during manual release.
- › After use, reset the auxiliary release and screw in and seal the locking screw (e.g. with sealing lacquer).
- › The auxiliary key release must not be used to lock the switch during servicing to prevent activation of guard locking, for example.
- › Loss of the release function due to mounting errors or damage during mounting.
- › Check the release function every time after mounting.
- › Please observe the notes on any enclosed data sheets.

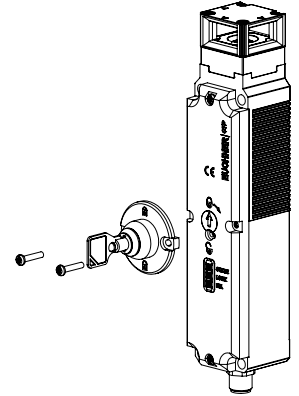
##### 7.1.1. Actuating auxiliary release

1. Unscrew locking screw.
  2. Using a screwdriver, turn the auxiliary release to  in the direction of the arrow.
- ➔ Guard locking is released.



### 7.1.2. Actuating auxiliary key release

On devices with auxiliary key release (can be retrofitted), simply turn the key to release. Function as for auxiliary release. For mounting, see the auxiliary key release supplement.



## 7.2. Emergency release

Permits opening of a locked guard from outside the danger zone without tools. For mounting, see the mounting supplement.



### Important!

- › It must be possible to operate the emergency release manually from outside the protected area without tools.
- › The emergency release must possess a marking indicating that it may be used only in an emergency.
- › The actuator must not be under tensile stress during manual release.
- › The emergency release must be sealed or the misuse of the release function must be prevented in the control system.
- › The release function meets all other requirements from EN ISO 14119.
- › The emergency release meets the requirements of Category B according to EN ISO 13849-1:2015.
- › Loss of the release function due to mounting errors or damage during mounting.
- › Check the release function every time after mounting.
- › Please observe the notes on any enclosed data sheets.

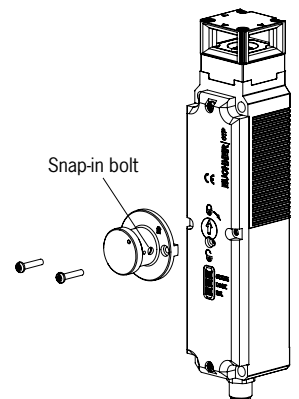
### 7.2.1. Actuating emergency release

Turn emergency release clockwise until it clicks into place.

➔ Guard locking is released.

To reset, press the snap-in bolt inward using a small screwdriver or similar tool and turn the emergency release back.

Open the guard and close it again after resetting the emergency release. The device will then operate normally again.



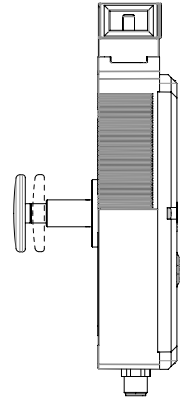
### 7.3. Escape release (optional)

Permits opening of a locked guard from the danger zone without tools (see chapter 13.2. *Dimension drawing for safety switch CTP... on page 20*).



#### Important!

- › It must be possible to actuate the escape release manually from inside the protected area without tools.
- › It must not be possible to reach the escape release from the outside.
- › The actuator must not be under tensile stress during manual release.
- › The escape release meets the requirements of Category B according to EN ISO 13849-1:2015.



#### 7.3.1. Actuating escape release

Press the red release knob to the end stop.

➔ Guard locking is released.

Pull the knob out again to reset.

Open the guard and close it again after resetting the escape release. The device will then operate normally again.

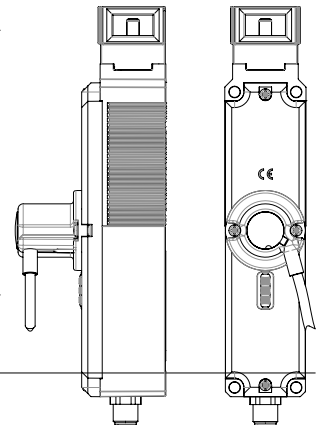
### 7.4. Wire front release (bowden)

Release via a pull wire. Depending on the type of attachment, the wire front release can be used as a front release or escape release.



#### Important!

- › The wire front release meets the requirements of Category B according to EN ISO 13849-1:2015.
- › The correct function depends on the laying of the pull wire and the attachment of the pull handle. The plant manufacturer is responsible for proper installation; the notes from chapter 7.4.1 must be observed.
- › The actuator must not be under tensile stress during manual release.



#### 7.4.1. Laying wire front release



#### Important!

- › Loss of the release function due to mounting errors, damage or wear.
- › Check the release function every time after mounting.
- › When routing the wire front release, ensure that it operates smoothly.
- › Observe the min. bending radius (100 mm) and minimize the number of bends.
- › The switch is not allowed to be opened.
- › Observe the notes on the enclosed data sheets.

## 8. Changing the approach direction

The approach direction needs to be changed only if the switch is to be approached from the rear.

Proceed as follows:

1. Remove the screws from the safety switch.
2. Set the required direction.
3. Tighten the screws with a torque of 1.2 Nm.

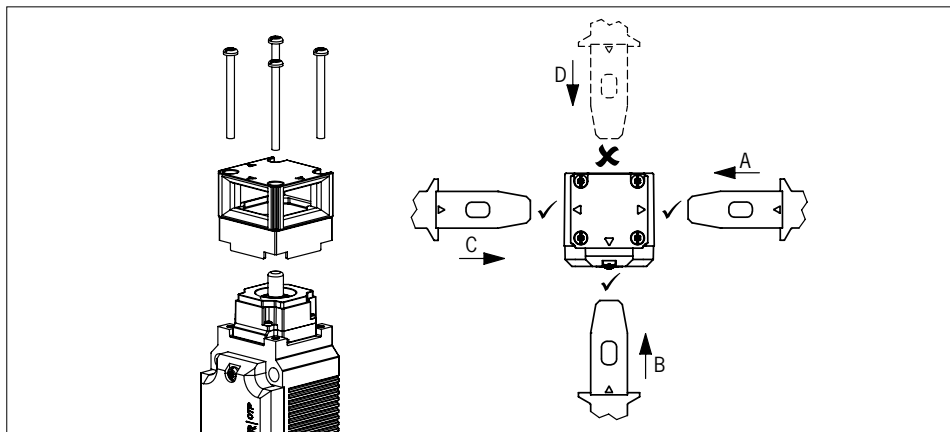


Figure 1: Changing the approach direction

### 9. Mounting



#### CAUTION

Safety switches must not be bypassed (bridging of contacts), turned away, removed or otherwise rendered ineffective.

- › Observe EN ISO 14119:2013, section 7, for information about reducing the possibilities for bypassing an interlocking device.



#### NOTICE

Risk of damage to equipment and malfunctions as a result of incorrect installation.

- › Safety switches and actuators must not be used as an end stop.
- › Observe EN ISO 14119:2013, sections 5.2 and 5.3, for information about mounting the safety switch and the actuator.
- › Protect the switch head against damage, as well as penetrating foreign objects such as swarf, sand and blasting shot, etc.
- › Observe the min. door radii (see chapter 13.3.1. *Dimension drawing for actuator CTP-... on page 22*).
- › Observe the tightening torque for fastening the switch (max.1.4 Nm).

A clearance of 12 mm must be maintained around the actuator head (see *Figure 2*).

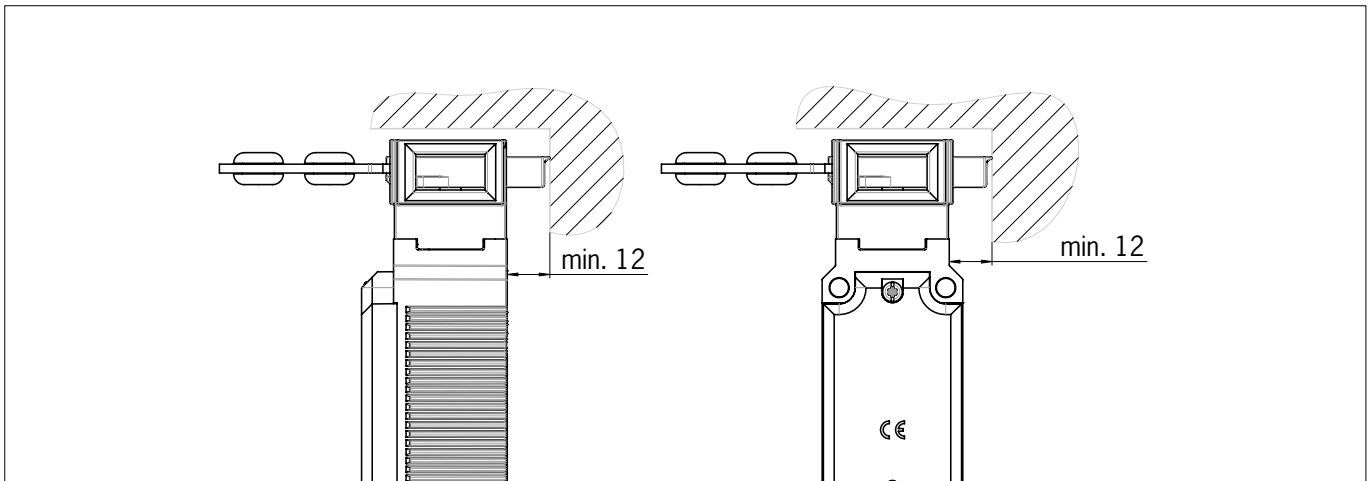


Figure 2: Actuator head clearance

## 10. Electrical connection

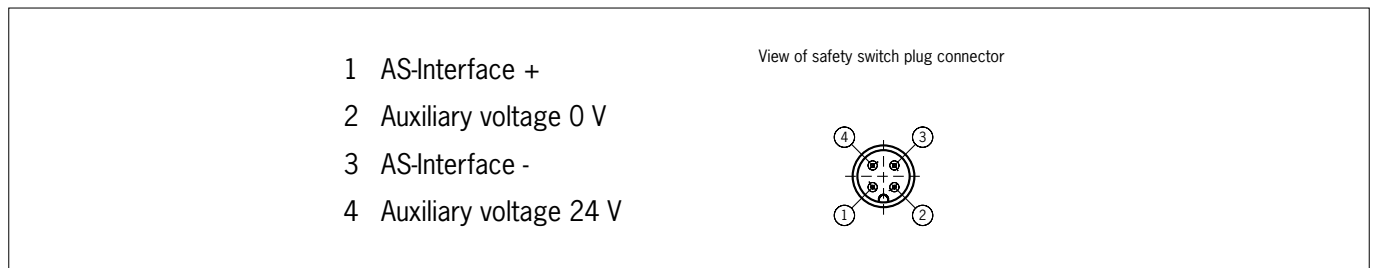



Figure 3: Terminal assignment, AS-Interface M12 plug connector

### 10.1. Notes about



#### Important!

- This device is intended to be used with a Class 2 power source in accordance with UL1310. As an alternative an LV/C (Limited Voltage/Current) power source with the following properties can be used:
  - This device shall be used with a suitable isolating source in conjunction with a fuse in accordance with UL248. The fuse shall be rated max. 3.3 A and be installed in the max. 30 V DC power supply to the device in order to limit the available current to comply with the UL requirements.  Please note possibly lower connection ratings for your device (refer to the technical data).
- For use and application as per the requirements of UL <sup>1)</sup> a connecting cable listed under the UL category code CYJV/7, min. 24 AWG, min. 80 °C, must be used.

1) Note on the scope of the UL approval: the devices have been tested as per the requirements of UL508 and CSA/ C22.2 no. 14 (protection against electric shock and fire).

### 10.2. Setting the AS-Interface address

The address can be set prior to or after mounting.

The AS-Interface address of the safety switch is set using an AS-Interface programming device. Addresses 1 to 31 are valid.

The unit is programmed by connecting the programming device to the M12 plug connector of the safety switch with a programming cable.

Address 0 is the default setting on delivery (the AS-Interface LED flashes alternately red/yellow).

### 10.3. Configuration in the AS-Interface safety monitor

(see operating instructions for the AS-Interface safety monitor)

#### 10.3.1. Dual-channel dependent

**Cat.  
4**

The safety switch is configured in the AS-Interface safety monitor with the AS-Interface address set as follows, for example:

- Dual-channel dependent
- With or without start-up test
- Synchronization time  $\geq 100$  ms

### 10.3.2. Dual-channel positively driven

**Cat.  
4**

The safety switch is configured in the AS-Interface safety monitor with the AS-Interface address set as follows, for example:

- Dual-channel positively driven
- With or without start-up test

### 10.4. AS-Interface status messages

A dual LED (red/green) displays the colors red, green and yellow. The following table provides assistance with troubleshooting.

State ASI LED	Explanation
green	Normal operation
red	No data exchange between master and slave Cause: - Master in STOP mode - Slave not in LPS - Slave with wrong IO/ID
red/yellow alternately flashing	No data exchange between master and slave Cause: slave address=0
red/green alternately flashing	Device fault in the slave. Contact the manufacturer.
red flashing	

### 10.5. Safety in case of faults

The AS-Interface power supply and the auxiliary voltage are reverse polarity protected.

### 10.6. Connection of guard locking control

#### 10.6.1. Guard locking control by means of switching the auxiliary voltage

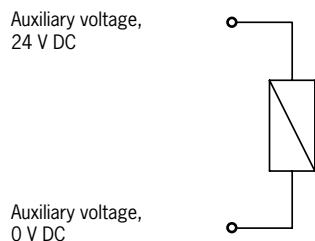


Figure 4: Connection example: guard locking control by means of switching the auxiliary voltage

#### 10.6.2. Guard locking control via ASi bit D0

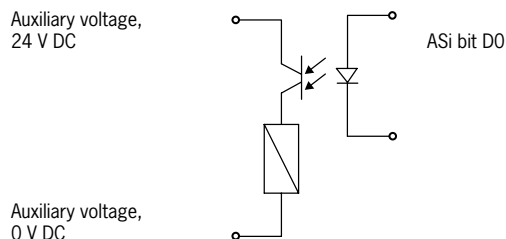


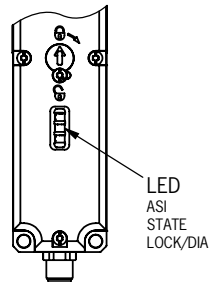
Figure 5: Connection example: guard locking control via ASi bit D0

## 11. Setup

### 11.1. LED displays

You will find a detailed description of the signal functions in chapter 12. *System status table on page 18.*

LED	Color
ASI	green/red
STATE	green
LOCK/DIA	yellow/red



### 11.2. Teach-in function for actuator (only for unicode evaluation)

The actuator must be allocated to the safety switch using a teach-in function before the system forms a functional unit. The half-sequence is output during a teach-in operation. The number of possible teach-in operations is unlimited.



#### Tip!

Prior to switching on, close the guard on which the actuator to be taught-in is installed. The teach-in operation starts immediately after switching on.



#### Important!

- › The teach-in operation may be performed only if the device does not have any internal fault.
- › Devices in the condition as supplied remain in teach-in standby state until they have successfully taught-in the first actuator. Once taught-in, switches remain in the teach-in standby state for approx. 3 min. after each switch-on.
- › The safety switch disables the code of the preceding device if teach-in is carried out for a new actuator. Teach-in is not possible again immediately for this device if a new teach-in operation is carried out. The disabled code is released again in the safety switch only after a third code has been taught-in.
- › The safety switch can be operated only with the last actuator taught-in.
- › If the switch detects the actuator that was most recently taught-in when in the teach-in standby state, this state is ended immediately and the switch changes to normal operation.
- › The actuator to be taught-in is not activated if it is within the actuating range for less than 30 s.

#### 11.2.1. Actuator teach-in

1. Establish teach-in standby:
  - Devices in the condition as supplied: unlimited teach-in standby after switching on
  - Switch already taught-in: teach-in standby is available for approx. 3 min after switching on
- ➔ Teach-in standby indication, STATE LED flashes 3x repeatedly.
2. Insert the actuator during teach-in standby.
  - ➔ The automatic teach-in operation starts (duration approx. 30 s). During the teach-in operation the STATE LED flashes (approx. 1 Hz). Alternate flashing of the STATE and LOCK/DIA LEDs acknowledges the successful teach-in operation. Teach-in errors are indicated by the illumination of the red LOCK/DIA LED and a flashing code on the green STATE LED (see chapter 12. *System status table on page 18*).
3. Switch off operating voltage (min. 3 s).
  - ➔ The code of the actuator that was just taught-in is activated in the safety switch.
4. Switch on operating voltage.
  - ➔ The device operates normally.



### 11.3. Functional check



#### WARNING

Danger of fatal injury as a result of faults in installation and functional check.

- › Before carrying out the functional check, make sure that there are no persons in the danger zone.
- › Observe the valid accident prevention regulations.

#### 11.3.1. Mechanical function test

The actuator must slide easily into the actuating head. Close the guard several times to check the function. For devices with mechanical release (emergency release or escape release), the correct function of the release must be checked as well.

#### 11.3.2. Electrical function test



























After installation and any fault, the safety function must be fully checked. Proceed as follows:

1. Switch on operating voltage.
  - ➔ The machine must not start automatically.
  - ➔ The safety switch carries out a self-test. The green STATE LED then flashes at regular intervals.
2. Close all guards. In case of guard locking by solenoid force: activate guard locking.
  - ➔ The machine must not start automatically. It must not be possible to open the guard.
  - ➔ The green STATE LED and the yellow LOCK/DIA LED are illuminated continuously.
3. Enable operation in the control system.
  - ➔ It must not be possible to deactivate guard locking as long as operation is enabled.
4. Disable operation in the control system and deactivate guard locking.
  - ➔ The guard must remain locked until there is no longer any risk of injury.
  - ➔ It must not be possible to start the machine as long as guard locking is deactivated.

Repeat steps 2 - 4 for each guard.

## 12. System status table

The dual LOCK/DIA LED displays the colors red and yellow. Depending on the state, both colors can flash alternately.

Operating mode	Actuator/door position	LED indicator Output		LOCK/DIA (yellow)	State
		STATE (green)	LOCK/DIA (red)		
Normal operation	closed		○		Normal operation, door closed and locked
	closed		○	○	Normal operation, door closed and <b>not</b> locked
	open	 1 x	○	○	Normal operation, door open
Teach-in operation (only unicode)	X	 3 x	○	○	Device in teach-in standby
	closed	 1 Hz	○	○	Teach-in operation
	X	 ↔ 		○	Positive acknowledgment after completion of teach-in operation
Fault display	X	 1 x		○	Fault in the teach-in operation (only unicode) Actuator removed from the actuating range prior to the end of the teach-in operation or faulty actuator detected
	X	 3 x		○	Read error (e.g. actuator faulty)
	X	 5 x		○	Disabled actuator detected
	X	○		X	Internal error
Key to symbols	○				LED not illuminated
					LED illuminated
	 1 x in-verse				LED illuminated, goes off briefly 1 x
	 1 Hz				LED flashes at 1 Hz
	 3 x				LED flashes three times, and this is then repeated
	 ↔ 				LEDs flash alternately
	X				Any state

After the output error has been remedied during operation, the fault display can generally be reset by opening and closing the guard. If the fault is still displayed afterward, use the reset function or briefly interrupt the power supply. This applies to all other fault displays as well.

Please contact the manufacturer if the fault display is not reset after restarting.



### Important!

If you do not find the displayed device status in the system status table, this indicates an internal device fault. In this case, you should contact the manufacturer.

### 13. Technical data



#### NOTICE

If a data sheet is included with the product, the information on the data sheet applies.

#### 13.1. Technical data for safety switch CTP-AS

Parameter	min.		Value typ.	max.	Unit
General					
Material	Die-cast zinc				
- Switch head	Reinforced thermoplastic				
- Switch housing					
Installation orientation	Any				
Degree of protection	IP67/IP69/IP69K (screwed tight with the related mating connector)				
Safety class acc. to EN IEC 61558	III				
Mechanical life	1 x 10 <sup>6</sup> operating cycles				
Ambient temperature at UB = 24 V	-20		-	+55	°C
Actuator approach speed, max.			20		m/min
Actuating/extraction/retention force at 20 °C			10/20/20		N
Locking force F <sub>max</sub> <sup>1)</sup>			3,900		N
Locking force F <sub>Zh</sub> <sup>1)</sup> acc. to EN ISO 14119			F <sub>Zh</sub> = F <sub>max</sub> /1.3 = 3,000		N
Weight			Approx. 0.42		kg
Connection	Plug connector M12, 4-pin				
For the approval acc. to UL the following applies	Operation only with UL class 2 power supply, or equivalent measures				
Resilience to vibration	Acc. to EN 60947-5-3				
EMC protection requirements	Acc. to EN 60947-5-3				
Ready delay	-		-	1	s
Risk time	-		-	260	ms
Turn-on time	-		-	400	ms
Frequency band	120 ... 130				kHz
Solenoid					
Auxiliary voltage	24 +10%/-15% (PELV)				V DC
Current consumption with auxiliary voltage	400				mA
Duty cycle	100				%
AS-Interface data		EA code: 7		ID code: B	
AS-i operating voltage	26.5		-	31.6	V DC
Total current consumption from AS-i	CTP...AS.A	-	-	450	mA
	CTP...AS.B	-	-	50	
Valid AS-Interface addresses	1 - 31				
AS-Interface inputs		Acc. to ASi Safety at Work			
Influenced by door position	CTP...AS2..	D0, D1, D2, D3			
AS-Interface outputs					
Guard locking solenoid	D0 (1 = solenoid energized)				
Reliability values acc. to EN ISO 13849-1					
Mission time	20				years
Monitoring of the guard position					
Category	4				
Performance Level (PL)	e				
PFH <sub>D</sub>	4.1 x 10 <sup>-9</sup> /h				

1) Dependent on the actuator used.

##### 13.1.1. Typical system times

Refer to the technical data for the exact values.

**Ready delay:** After switch-on, the device carries out a self-test. The system is ready for operation only after this time.

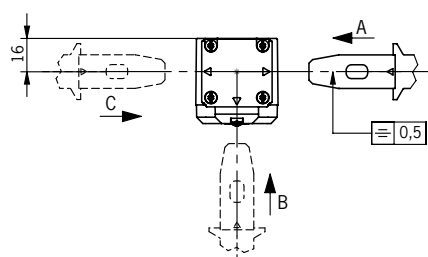
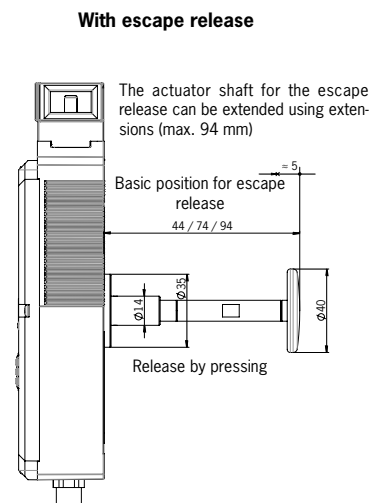
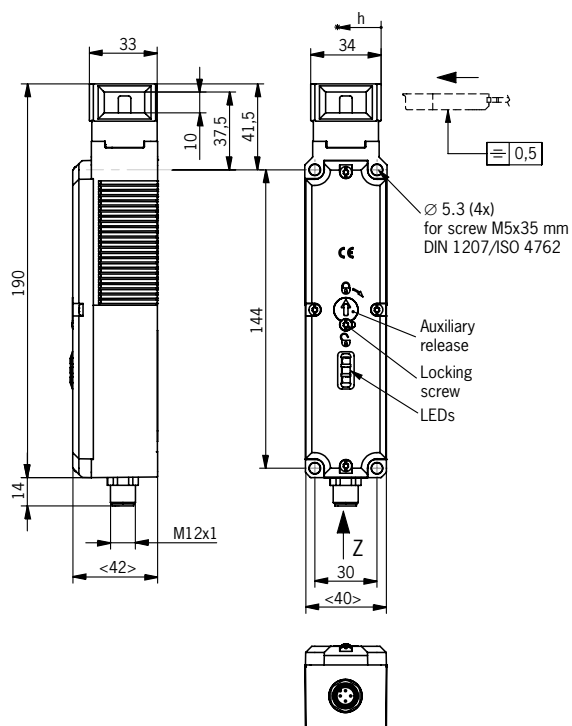
**Turn-on time of safety outputs:** The max. reaction time  $t_{on}$  is the time from the moment when the guard is locked to the moment when the safety outputs switch on.

**Risk time according to EN 60947-5-3:** If an actuator moves outside the actuating range, transmission of the code sequence on the corresponding safety switch is deactivated at the latest after the risk time.

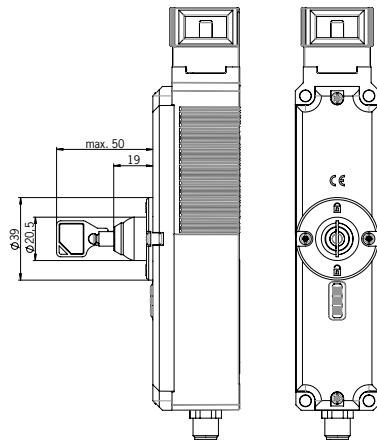
EN

## 13.2. Dimension drawing for safety switch CTP...

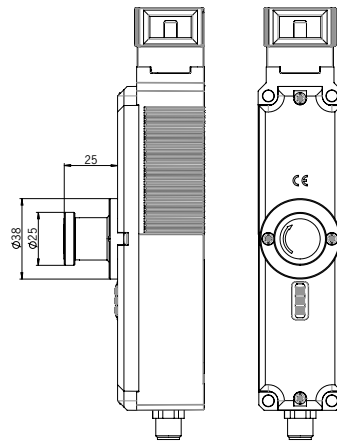
Version with plug connector M12



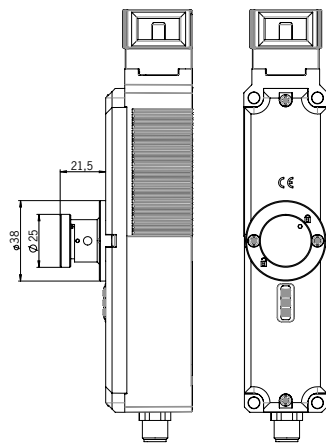
With auxiliary key release



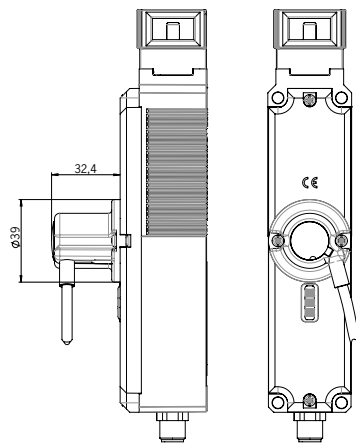
With auxiliary release



With emergency release



With wire front release

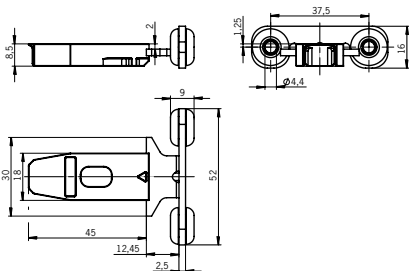
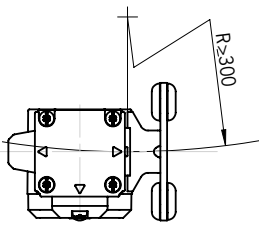
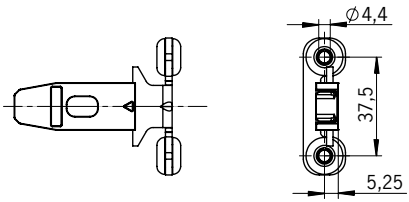
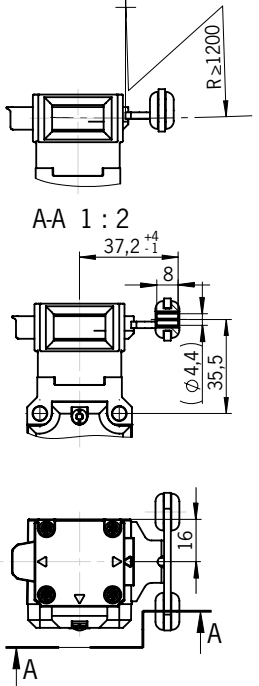


### 13.3. Technical data for actuator CTP-...

Parameter	Value			Unit
	min.	typ.	max.	
Housing material	Fiber reinforced plastic			
Weight	0.03 ... 0.06 (depending on version)			kg
Ambient temperature	-20	-	+55	°C
Degree of protection	IP67/IP69/IP69K			
Mechanical life	1 x 10 <sup>6</sup>			
Locking force, max. - Straight actuator 126015 (red) 122666 (black) - Hinged actuator - Bent actuator	3,900 2,600 2,600 1,500			N
Installation orientation	Any			
Power supply	Inductive via read head			

#### 13.3.1. Dimension drawing for actuator CTP-...

Dimension drawing		Min. door radius [mm]	Order no./item
Straight actuators			<b>122666</b> A-CH-G-SST-122666
			<b>126015</b> A-CH-G-SST-126015

Dimension drawing		Min. door radius [mm]	Order no./item
Bent actuators			<b>122667</b> A-C-HW-SST-122667
			<b>122668</b> A-C-HW-SST-122668

Dimension drawing		Min. door radius [mm]	Order no./item
Hinged actuators			<b>122671</b> A-CHRL-LS-122671
			<b>122672</b> A-CHRL-LS-122672
			<b>122675</b> A-CHRO-LS-122675
			<b>122676</b> A-CHRU-LS-122676



**Tip!**

Safety screws are included with the actuator.



## 14. Ordering information and accessories



### Tip!

Suitable accessories, e.g. cables or assembly material, can be found at [www.euchner.com](http://www.euchner.com). To order, enter the order number of your item in the search box and open the item view. Accessories that can be combined with the item are listed in *Accessories*.

## 15. Inspection and service



### WARNING

Danger of severe injuries due to the loss of the safety function.

- › If damage or wear is found, the complete switch and actuator assembly must be replaced. Replacement of individual parts or assemblies is not permitted.
- › Check the device for proper function at regular intervals and after every fault. For information about possible time intervals, refer to EN ISO 14119:2013, section 8.2.

Regular inspection of the following is necessary to ensure trouble-free long-term operation:

- › Check the switching function (see chapter 11.3. *Functional check on page 17*)
- › Check all additional functions (e.g. escape release, lockout bar, etc.)
- › Check the secure mounting of the devices and the connections
- › Check for soiling

No servicing is required. Repairs to the device are only allowed to be made by the manufacturer.



### NOTICE

The year of manufacture is given in the laser marking at the bottom right corner. The current version number in the format (V X.X.X) can also be found on the device.

## 16. Service

If servicing is required, please contact:

EUCHNER GmbH + Co. KG  
Kohlhammerstraße 16  
70771 Leinfelden-Echterdingen  
Germany

**Service telephone:**  
+49 711 7597-500

**E-mail:**  
[support@euchner.de](mailto:support@euchner.de)

**Internet:**  
[www.euchner.com](http://www.euchner.com)

## C €



EU-Konformitätserklärung  
EU declaration of conformity  
Déclaration UE de conformité  
Dichiarazione di conformità UE  
Declarație de conformanță UE

**Abstract**

The authors thank a reviewer for highlighting the need to include a paragraph about the ID. In fact, the authors had already done so, but the paragraph was not included in the final manuscript. The authors have now added a paragraph to the manuscript, as follows:

[illegible][illegible][illegible]

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For a given  $\alpha$ , the probability of a  $\beta$  is given by  $P(\beta|\alpha) = \frac{1}{N(\alpha)} \sum_{i=1}^N \delta_{\beta, \alpha_i}$ , where  $N(\alpha) = \sum_{i=1}^N \delta_{\alpha, \alpha_i}$  is the number of times  $\alpha$  appears in the data.

1. Name of the standard proposed	a	EN 60547-1:2017	1	EN 60547-1:2017 (M)
2. Number of standards used	b	EN ISO 14119:2017	1	EN 14119:2017
3. Technical committee responsible	c	EN ISO 13849-1:2015	5	EN 13849-1:2015
4. Member responsible for secretariat	d	EN 60295-1:2015 (M)		
5. Publication date of the standard	e	EN 60547-1:1997 (M)		

[illegible]
$$1 - \frac{1}{2} \left( \frac{1}{2} \right)^n = 1 - \frac{1}{2^{n+1}} = \frac{2^{n+1} - 1}{2^{n+1}} = \frac{2^{n+1} - 1}{2^{n+1}}$$
$$\lim_{n \rightarrow \infty} N(n) = 0$$



# EUCHNER

More than safety.

Get the complete information on the CTP-I-AS transponder-coded safety switch in the scope of the approval of the transponder-coded system by the competent authority (DIN EN 18194).  
Approved for the use and the corresponding responsibility in the scope of the approval.  
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